Product Environmental Profile

Altivar 21

22 to 75 kW – IP54 range

PEP ecoPASSPORT®

Schneider Electric

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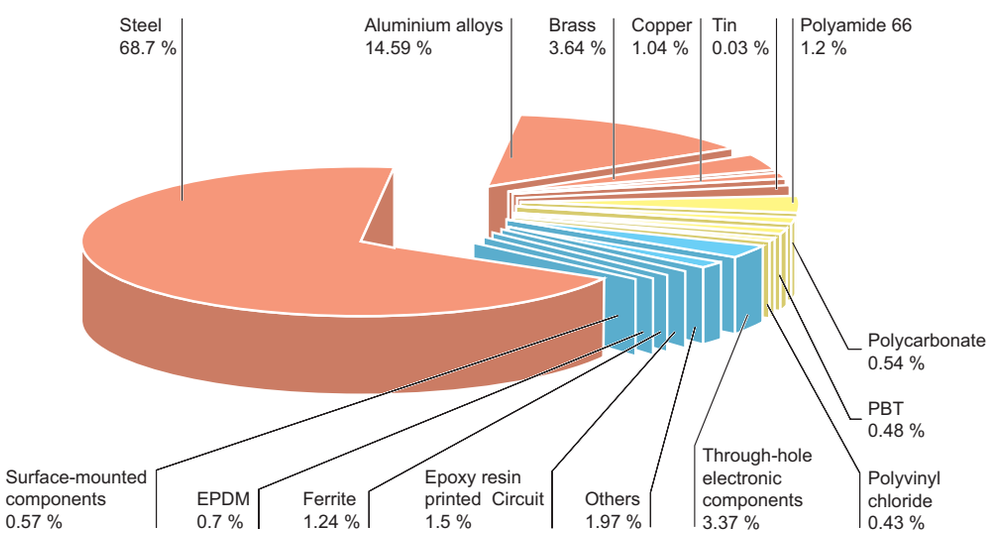
Product Overview

The main function of the Altivar 21 range is control and rotation speed variation of an asynchronous electric motor, mainly for HVAC applications.
This range comprises products from 0.75 to 75 kW, operating at voltages from 200 and 480 V, single or three-phase.
The representative product used for carrying out assessment is the complete Altivar 21 of rating 22 kW 400 V (ref ATV21WD22N4).
It is representative of the entire ATV21 22 to 75 kW IP54 range. Other products of the range are produced using the same technology and on the same production process.
Environmental assessment was carried out conforming to standard ISO 14040 "Environmental management: life cycle assessment, principle and framework".
This assessment takes account of product life cycle stages.

Constituent materials

Weight of products in the range is from 29000 g to 88000 g. It is 29168 g excluding packaging for the Altivar 21 - 22 kW 400 V assessed.
Constituent materials are broken down as follows:



Substance assessment

Products of this range are designed in conformity with the requirements of the RoHS directive (European Directive 2002/95/EC of 27 January 2003) and do not contain, or in the authorised proportions, lead, mercury, cadmium, chromium hexavalent, flame retardant (polybromobiphenyles PBB, polybromodiphenylthers PBDE) as mentioned in the Directive.

Manufacturing

This range is manufactured on a Schneider Electric production site operating to an ISO 14001 certified environmental management system.
Constant process improvement enables reduction by an average 5 % of annual energy consumption of the site.
Complete waste sorting enables achievement of a recovery rate of 99 %.

Distribution

Packaging has been designed with a view to reducing its weight and volume, respecting the packaging directive of the European Union.
The weight of packaging of the 14970 g, consisting of cardboard, wood and steel (recyclable materials).
Product distribution flows are optimised by location of local distribution centres in close proximity to market areas.

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Utilization

Products of the Altivar 21 - 22 to 75 kW IP54 range present no environmental stress requiring particular use precautions (noise, emissions, etc.).
Electrical energy consumed depends on product installation and use conditions.
Power consumed varies from 632 W to 1953 W. It is 632 W for the Altivar 21 - 22 kW 400 V and represents less than 3 % of total power through the product.

End of life

At end-of-life, products of the Altivar 21 range can either be dismantled or ground to recover maximum value of the various constituent materials.
Recovery potential is greater than 89 %.
This percentage consists of ferrous metals, copper and aluminium alloys and marked plastics.
Products of this range also include electronic cards to be extracted and directed towards specialised processing channels.
End-of-life data is detailed in the product end-of-life sheet.

Environmental impacts

Life cycle assessment (LCA) was produced using EIME (Environmental Impact and Management Explorer) software, version 1.6 and its database version 5.4.
Product use duration is estimated as 10 years and the electrical energy model used is the European model.

Scope of assessment is the Altivar 21 – 22 kW 400 V IP54.

Environmental impacts have been assessed on phases of Manufacturing (M) including conversion of raw materials, Distribution (D) and Use (U).

Presentation of the environmental impacts

Environmental indicators	Unit	ATV21 IP54 22 kW 400 V SE (1.000 unit)			
		S = M + D + U	M	D	U
Raw Material Depletion	Y-1	**$1.18\ 10^{-12}$**	$8.64\ 10^{-13}$	$2.40\ 10^{-16}$	$3.15\ 10^{-13}$
Energy Depletion	MJ	**$3.55\ 10^{5}$**	$2.94\ 10^{3}$	$4.44\ 10^{2}$	$3.52\ 10^{5}$
Water depletion	dm^3	**$4.80\ 10^{4}$**	$1.99\ 10^{3}$	$1.26\ 10^{2}$	$4.59\ 10^{4}$
Global Warming	$g \approx CO_2$	**$2.24\ 10^{7}$**	$2.25\ 10^{5}$	$1.01\ 10^{4}$	$2.21\ 10^{7}$
Ozone Depletion	g≈CFC-11	**2.78**	$3.77\ 10^{-2}$	$2.39\ 10^{-3}$	2.74
Air Toxicity	m^3	**$4.61\ 10^{9}$**	$6.30\ 10^{7}$	$3.56\ 10^{6}$	$4.54\ 10^{9}$
Photochemical Ozone Creation	$g \approx C_2H_4$	**$7.93\ 10^{3}$**	$1.23\ 10^{2}$	10.8	$7.80\ 10^{3}$
Air acidification	$g \approx H^+$	**$3.79\ 10^{3}$**	41.6	2.69	$3.75\ 10^{3}$
Water Toxicity	dm^3	**$1.83\ 10^{6}$**	$5.34\ 10^{5}$	$2.97\ 10^{3}$	$1.30\ 10^{6}$
Water Eutrophication	$g \approx PO_4$	**$6.08\ 10^{2}$**	$5.22\ 10^{2}$	1.05	85.6
Hazardous waste production	kg	**$3.19\ 10^{2}$**	1.71	$2.38\ 10^{-1}$	$3.17\ 10^{2}$

Life cycle assessment has shown that Use phase (phase U) has the greatest impact on the majority of environmental indicators.
Assessment also shows that indicators of this phase are highly influenced by the "product thermal dissipation" parameter.

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System approach

As the product of the range are designed in accordance with the RoHS Directive (European Directive 2002/95/EC of 27 January 2003), they can be incorporated without any restriction within an assembly or an installation submitted to this Directive.

N.B.: please note that the environmental impacts of the product depend on the use and installation conditions of the product.
Impacts values given above are only valid within the context specified and cannot be directly used to draw up the environmental assessment of the installation.

Glossary

Raw Material Depletion (RMD)

This indicator quantifies the consumption of raw materials during the life cycle of the product. It is expressed as the fraction of natural resources that disappear each year, with respect to all the annual reserves of the material.

Energy Depletion (ED)

This indicator gives the quantity of energy consumed, whether it be from fossil, hydroelectric, nuclear or other sources.
This indicator takes into account the energy from the material produced during combustion. It is expressed in MJ.

Water Depletion (WD)

This indicator calculates the volume of water consumed, including drinking water and water from industrial sources. It is expressed in dm^3.

Global Warming (GW)

The global warming of the planet is the result of the increase in the greenhouse effect due to the sunlight reflected by the earth's surface being absorbed by certain gases known as "greenhouse-effect" gases.
The effect is quantified in gram equivalent of CO_2.

Ozone Depletion (OD)

This indicator defines the contribution to the phenomenon of the disappearance of the stratospheric ozone layer due to the emission of certain specific gases. The effect is expressed in gram equivalent of CFC-11.

Photochemical Ozone Creation (POC)

This indicator quantifies the contribution to the "smog" phenomenon (the photochemical oxidation of certain gases which generates ozone) and is expressed in gram equivalent of ethylene (C_2H_4).

Air Acidification (AA)

The acid substances present in the atmosphere are carried by rain.
A high level of acidity in the rain can cause damage to forests.
The contribution of acidification is calculated using the acidification potentials of the substances concerned and is expressed in mode equivalent of H^+.

Hazardous Waste Production (HWP)

This indicator calculates the quantity of specially treated waste created during all the life cycle phases (manufacturing, distribution and utilization). For example, special industrial waste in the manufacturing phase, waste associated with the production of electrical power, etc.
It is expressed in kg.

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